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THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 2, 1943



Not Mechanized

See Page 217

A SCIENCE SERVICE PUBLICATION

Do You Know?

A ton of *cabbage*, when dehydrated and compressed, occupies two cubic feet.

Over 5,000 workers are now collecting latex for *rubber* in the forests of Guatemala, Nicaragua and Costa Rica.

Apple production in the United States will be about 93,000,000 bushels, approximately 28% less than in 1942.

Losses by *fire* in the United States amounted to \$315,000,000 in 1942; they threaten to reach \$400,000,000 this year.

Fats are among the earliest medicines used by man; the fat of nearly every animal was believed to have some medical value.

Over 162,000 deer and elk *hides* collected during the 1942-43 hunting season, have been used for service gloves and other military purposes.

The 1,000,000th standard *shotgun* of the type used for training Army Air Force aerial gunners was recently received and accepted by the Army.

Egg-breakers in egg-drying plants are responsible for catching off-quality *eggs*; human noses and eyes are not apt to be replaced by any mechanical device for this purpose.

Rayon is now used in cartridge and powder bags for artillery; like silk, it burns instantaneously, leaving no heated fragments which might prematurely ignite the next powder charge.

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RESOURCES

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Electric motor clinics to which farmers may bring motors for cleaning and adjustment are conducted by the New York State College of Agriculture in rural centers throughout the state.

The Pribilof islands in the Bering Sea, some 200 miles northwest of Dutch Harbor, are the only places where the Alaska fur seals ever seek the shore; these islands are their breeding grounds.

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CHEMISTRY

Anti-Freeze in Tires

Tubeless tractor tires filled with anti-freeze solution promise better wear, less slip; may be post-war answer for better farm tractor tires.

► **TUBELESS TIRES** completely filled with an anti-freeze solution of calcium chloride may be the post-war answer to the need for better farm tractor tires, E. F. Brunner of the Goodyear Tire and Rubber Company reported to the meeting of the Society of Automotive Engineers in Milwaukee.

Main handicap of tubeless tires so far has been that air diffuses deep into the tire, building up internal pressure that eventually causes it to fail. Development of an inner liner that will prevent this diffusion has been a long term research problem.

"So far, the rubber industry has not been able to find a diffusionless material," Mr. Brunner reported. "Certain synthetic rubbers are better from a diffusion standpoint than others, and maybe synthetics will show us the way to a tubeless tire."

Recent experiments have tried using a tire completely filled with a solution of calcium chloride. This gives no diffusion difficulties, as there is no air present. But another problem is posed due to a tendency of the solution to lubricate the bead and cause working and chafing which eventually permits the solution to enter the tire casing through the bead, resulting in tire failure.

The 100% liquid-filled tire is a further development of a tire filled to valve level with liquid and the remain-

ing space filled with air, a method already in use for several years.

For the past two-and-a-half years, 35 tractors with completely liquid-filled tires have been checked for pressure changes during regular farm use, Mr. Brunner announced. The minimum pressure recorded in extremely cold weather was nine pounds, and the maximum on hot days was 15 pounds. Tires were originally filled at 12 pounds pressure at about 60 degrees Fahrenheit.

"This we consider a practical range," Mr. Brunner said, "much the same as is likely to be had with air tires due to inaccurate gauges, etc."

Furthermore, the pressure is maintained since air loss through diffusion is eliminated. Most failures of air-filled tractor tires develop from diagonal breaks on the interior of the sidewall, and are due entirely to low pressure.

Another money-saving advantage of liquid-filled tires is reduced slipping when the tractor is under a heavy pull. Comparative tests in both loose and hard dry clay soil showed that 100% liquid-filled tires had from 41% to 230% less slip, depending on the load, than similar air-filled tires.

"Since tire tread wear is almost directly proportional to per cent slip," Mr. Brunner pointed out, "you can readily see how the farmer can easily increase the life of his tires from 50% to 75%."

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low angle and light enough to be carried rapidly from one position to another by a few men. It throws grenades of various types, but the one favored in British anti-tank practice is a self-igniting phosphorus bomb enclosed in a glass bottle—a kind of sophisticated version of the fiery Molotov cocktail.

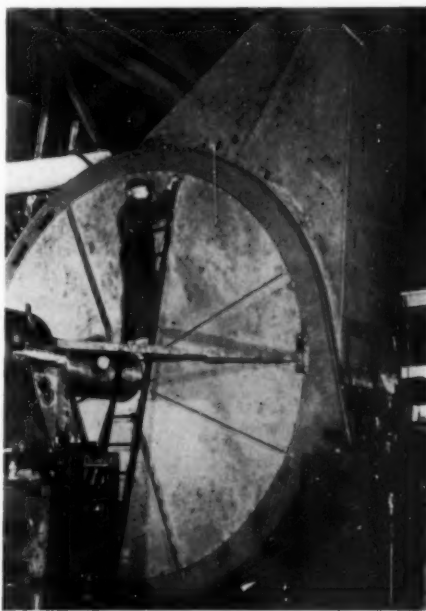
The range of the Northover projector is short, and it is designed primarily as a weapon for the defense of villages or important road crossings. It is sighted up to 200 yards, though its extreme range is half again that much.

Ordinarily this projector is fired from a four-legged stand that looks a good deal like a machine-gun tripod except for the extra leg. It can, however, be set on a higher stand that permits it to be used against low-flying airplanes.

Since the range is short and the weapon's position usually vulnerable, it is important that the enemy tank be disabled or blinded by the first shot. Some of the projectors are equipped with double barrels, permitting another shot to be fired right after the first.

The Northover projector was first produced to meet a dire necessity, when an invasion of Britain seemed imminent, and an effective tank-stopper was needed.

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GIANT tanker motors such as this are being built for U. S. Maritime Commission tankers. The sheet-iron covering keeps dirt out of the enclosed, ventilated motor. Each General Electric motor being built at Schenectady is equipped with an air re-circulation system.

MILITARY SCIENCE

English Grenade-Thrower

Northover projector, small-caliber breach-loading mortar, designed as an anti-tank weapon for the man on foot.

► **THE SAME NEED** for a weapon enabling the man on foot to fight back against tanks that brought forth the American "bazooka" was responsible for the development of a totally different kind of British weapon, known as the Northover projector. Hitherto but little publicized, it is described by a veteran

British officer, Maj. Gen. H. Rowan-Robinson, in the technical journal, *Army Ordnance* (Sept.-Oct.)

The Northover projector is a grenade-thrower, but it is not a tube discharging rocket-grenades, like the "bazooka." It is essentially a small-caliber breech-loading mortar, capable of being fired at a



MAP MAKING—Thomas P. Pendleton, chief topographic engineer of the U. S. Geological Survey, is checking a model including two Multiplex aero-projectors, which aids in map making for Uncle Sam.

CARTOGRAPHY

Strategic Areas Mapped

Many localities are being charted adequately for the first time by photogrammetry methods that are three to five times faster than older ways.

► **MANY STRATEGIC** areas in America are being adequately mapped for the first time, using methods three to five times as fast as pre-war methods, William Emory Wrather, director of the U. S. Geological Survey, reported to Secretary of the Interior Harold L. Ickes.

Less than half of the United States has been comprehensively plotted, Mr. Wrather disclosed, despite the 167 years of our national existence. Much of the area requiring additional mapping lies in the central and western states. But there are also regions along the coast which have not been mapped to show the actual shape and elevation of land surface, streams and drainage, the location and extent of cities and towns, roads, dams, forests, boundary lines and other culture.

"In certain strategic areas along the coastline," Mr. Wrather reported, "mili-

tary requirements have resulted in a 60% increase over last year in the square mileage of mapping produced monthly by the topographic branch of the survey."

Of 228 areas in which mapping was completed last year, 166 were required by the military.

Improved stereoscopic plotting of aerial photographs, called photogrammetry, is only about a third as expensive and much faster than former methods when used under favorable conditions. In effect the procedure brings the terrain right into the laboratory.

To get a three-dimensional view, the operator views plates of aerial photograph negatives through an optical system which is basically like the stereoscope through which the older generation once peered for natural-depth scenic views as a parlor pastime.

By moving a small plotting device,

called a tracing table, over the map sheet, the operator then makes a pencil drawing of the culture, drainage and contours. A photographic copy of the drawing is then taken to the field for checking features that could not be identified on the photographs, and to secure names.

Post-war uses, as well as military service, is foreseen for the maps since they are valuable in planning and executing flood control, river and harbor improvements, power and irrigation projects, highway location and construction, forest administration, erosion control, drainage enterprises and mineral and soil surveys.

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NUTRITION

Warning Against Using Synthetic Protein

► **A WARNING** against use of what might be called a synthetic protein fare for human nourishment appears in a report by Dr. Anthony A. Albanese and Miss Virginia Irby, of the Johns Hopkins Hospital (*Science*, Sept. 24).

Proteins, the nourishment for which one eats meat, cheese, poultry and so on, are made of chemicals called amino acids. Certain of the amino acids are essential for human nutrition, and a mixture of these might form a synthetic protein fare for sick people unable to eat protein food or to utilize it properly. It has been reported that animals can live on such a mixture of the 10 essential amino acids without any other source of the protein building blocks.

The Hopkins scientists tested this by giving one group of rats an amino acid mixture and comparing their growth and survival with that of another group fed amino acids as they occur naturally in casein, the chief protein of milk. The casein was given in the forms of an enzymatic digest or an acid hydrolysate, such as might be used for nourishing patients who could not eat or properly digest protein foods.

The mixture of essential amino acids was found "to be inferior from a nutritional point of view" to the other two sources of amino acids. The failure of the mixture of acids to nourish the animals adequately may be due, the scientists suggest, to poisonous effects of unnatural forms of the acids which the animals could not utilize. Until further work shows whether or not this is true, they state, "it would seem wise to employ only the natural forms in human therapy."

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MEDICINE

Malaria Symptoms Vary

Navy medical officer warns that chills and fever are not a constant symptom of malaria; advises against prophylactic atabrine doses except at front.

► **CONTRARY** to the popular impression among both laymen and many civilian physicians, chills and fever are not a constant symptom of malaria, warns Lt. Comdr. David R. Talbot, U.S.N.R. (*Journal, American Medical Association*, Sept. 25).

Malaria may mimic many different diseases and often the symptoms appear "inconsequential," such as vague aches and pains or skin eruptions, Commander Talbot and other medical men serving with the armed forces in malaria regions have found. The absence of chills and fever should not mislead the doctor to think the patient does not have malaria, if the patient has lived or is living in the tropics or some other malaria region.

Commander Talbot studied "two different theories of anti-malarial tactics" while on duty at an outlying base where both Army and Navy personnel were living under identical conditions of exposure to malaria. The Army group was getting regular prophylactic doses of atabrine. The Navy group was given treatment only as they showed symptoms of malaria or had positive blood tests for the infection.

When routine blood tests (thick smears) were done on all the personnel, regardless of whether or not any had symptoms of malaria, the medical officers were "astonished" to find that 66% of the Navy personnel had malaria parasites in their blood, while 48% of the Army personnel likewise showed the parasites in their blood.

In the past there had been quite a lot of frank, easily diagnosed malaria in the Navy group but very little in the Army group that was getting the prophylactic atabrine. However, when malaria did appear in the Army group, it was much more severe and took longer to cure. This convinced the doctors that the prophylactic treatment was masking symptoms while the malaria parasites were insidiously damaging the man's blood-forming organs, so that when the disease did develop, the patient's natural defensive mechanisms were so impaired that a more serious type of sickness than usual resulted.

Commander Talbot therefore believes that during peace or at bases men should be treated for malaria only after they become infected, rather than given prophylactic treatment. In an area of active combat, however, where a maximum number of men must be kept in the field to fight and especially where malaria caused by *P. falciparum* is prevalent, prophylactic measures must be adopted.

In malaria regions, he also advises, it should be a monthly routine to examine thick smears of blood from all military personnel. All persons showing malaria parasites in these examinations, whether they have symptoms of malaria or not, should be treated vigorously to forestall attacks.

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ASTRONOMY

Shell of Star in Libra Composed of Many Layers

► **THE SHELL** of a star in the constellation of Libra, which is not now visible in our evening sky, is composed of many intensely hot layers, each rotating at its own speed.

A layer of nickel in a gaseous state is on the outside of 48 Librae, and titanium and probably manganese, are in the deeper strata, Dr. Otto Struve, director of Yerkes Observatory, Williams Bay, Wis., reports (*Astrophysical Journal*, July).

The outermost layers of the shell rotate slowly, while the inside layers revolve much more rapidly, estimates Dr. Struve. The layers within the shell seem to be slightly expanding at certain times, and contracting at others, adding to the complexity of the action of the stratified shell.

"The star 48 Librae presents a notable paradox," concludes Dr. Struve. It combines many of the characteristics of a supergiant and a main-sequence star. The star lying beneath these thin whirling metallic layers seems to be a relatively well-behaved main-sequence B-type star.

At present the shell is fairly trans-

parent in the ordinary photographic region of the spectrum, but is essentially opaque toward the violet end.

The spectrum of the star has undergone a distinct change in recent years, reflecting changes within the star itself. During the last ten or twenty years a strong metallic absorption spectrum has developed, showing that the light from the hot center of the star was shining through an increasing number of metallic gases with temperature lower than that of the inner source of light.

The spectrum of 48 Librae is believed to denote a shell in many ways resembling the shell of Pleione as observed in 1940.

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RESOURCES

Oil Finds and Imports Needed to Increase Supply

► **UNLESS** new oil finds or imports are increased civilians face a further cut in use of gasoline and oil, Harry C. Wiess, president of the Humble Oil and Refining Company, declares in a report to the American Institute of Mining and Metallurgical Engineers.

More than 4,150,000 barrels of American oil are being used at home and abroad every day and requirements for next year may average over 4,400,000 barrels.

Although military demands cannot be revealed, the production of aviation gasoline alone in this country already exceeds the crude oil production available to Germany from its own fields and those of Hungary and Rumania.

"Motorists may well ask," says Mr. Wiess, "why further rationing should be discussed if passenger cars are currently using some 500,000 barrels daily less gasoline than before the war, while the nation has increased its production of crude oil. The answer is to be found in the drastic changes that have occurred in refinery operations in order to supply aviation gasoline, materials for the synthetic rubber program, and other war products."

We have about reached the peak of our efficiency in production, Mr. Wiess believes, and that peak is about 250,000 barrels per day short of the estimated daily need for 1944. He believes that the least desirable solution to the problem is further increased production at the risk of depleting our reserves, since less oil can be recovered when overproduction is attempted.

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PUBLIC HEALTH

Draft Rejection Causes

Leading reasons for deferment among 18 and 19 year olds are eye defects, mental disease among whites; educational defects, syphilis among Negroes.

►THE LEADING causes of draft rejections among a sample of 18 and 19 year olds are reported by Col. Leonard G. Rowntree, Kenneth H. McGill and Dr. Thomas I. Edwards, of national headquarters of the Selective Service System (*Journal, American Medical Association*, Sept. 25).

For white youths in the sample group, the leading causes of rejection during December, 1942, and January and February, 1943, were, in decreasing order of occurrence: eye defects, mental disease, musculoskeletal defects, heart and blood vessel defects, ear defects, hernia, neurologic defects, educational deficiency, underweight and mental deficiency.

For Negroes during the same period the 10 leading rejection causes were: educational deficiency, syphilis, heart and blood vessel defects, mental disease, musculoskeletal defects, hernia, eye defects, neurologic defects, mental deficiency and tuberculosis.

Of the white youths called up for physical examination, 23.8% were rejected at local boards or induction stations. The rate was almost twice as high for Negroes: 45.5%. The rates are only slightly lower than for older regis-

trants but, the Selective Service officials point out, one should be cautious in drawing conclusions from this. Large numbers of physically fit 18 and 19 year olds entered the armed forces by enlistment, and the Selective Service figures do not cover findings on these youths. An additional number are in schools or colleges and their examinations postponed until after this training period. Still others are deferred because of employment in war industry or agriculture.

Comparison of rejection causes between the 18 and 19 year olds and the older men called up previously cannot be made very readily because standards for eyes, teeth and educational qualifications have been revised and increased attention given to psychiatric examination.

Between November, 1940, and May, 1941, the 10 leading causes of rejection for white and Negroes combined, aged 21 to 36, were: teeth, eyes, heart and blood vessel defects, musculoskeletal defects, mental and nervous defects, hernia, ears, feet and tuberculosis and other lung defects.

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AGRICULTURE

100 Years in Research

Famous Rothamsted, reputed to be oldest agricultural experiment station in the world, is celebrating its centennial despite the war.

►ONE HUNDRED years old this year, the famous Rothamsted Agricultural Experimental Station, located at Harpenden, England, is now celebrating its centennial in spite of the war. It is reputed to be the oldest agricultural research institution in the world.

The founder of the research station, Sir John Bennet Lawes, remained its active director until his death in 1900. Sir Joseph Henry Gilbert, a chemist, was associated with him during these 57 years. He died in 1901.

When the station was established,

chemistry was thought to be the only science that seemed to bear on agriculture. For that reason first emphasis was placed on chemical problems having to do largely with the feeding of plant life, and out of it came the creation of what were then called artificial fertilizers.

To carry out the work of making satisfactory artificial fertilizers, and to test the compounds and mixtures made, experimental plots were established and the new fertilizers tried on various crops. The famous wheat plots on Broadbalk carried this year their hundredth con-

secutive crop of wheat. Other plots have carried other consecutive crops for many years.

The chemistry of farm animal feeding also received early attention at Rothamsted. Animals were fed special diets over specified periods, were then slaughtered, and their body contents analyzed chemically. This early work established the basis for all the later qualitative studies of animal nutrition.

Rothamsted's work today includes all branches of scientific agriculture. Its main objective remains the objective set by its founder. As stated by the British Council: "This purpose of gaining knowledge, of developing a subject that experts can use, and of providing basic information for teachers, farmers, inventors, and all interested, has always been uppermost at Rothamsted."

Sir John Lawes started the Rothamsted station on his own inherited estate. He used his lands even before creating the research center for farm demonstration work. Whether or not the idea of this work and the establishment of a scientific station originated with him is not certain. Others had proposed similar undertakings at an earlier date. Antoine Laurent Lavoisier, the great eighteenth-century French scientist, who was born just 100 years previous to the establishment of Rothamsted, started a model farm in 1778, and in 1785, while secretary of the French Committee on Agriculture, he recommended the establishment of agricultural experiment stations.

In the United States the first agricultural experiment station with state support was the Connecticut station, established in 1875. By 1887 there were 18 stations although some had only meager support. In that year Congress passed the far-reaching Hatch Act which gave Federal financial assistance for experiment stations connected with all the land-grant state agricultural colleges established under the well-known Land Grant Act of 1862.

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GENERAL SCIENCE

Science Interchanges With Mexico Praised

►SCIENCE is one of the finest mediums to promote friendship between Mexico and the United States in the opinion of Nelson Rockefeller, Coordinator of Inter-American Affairs, expressed during his visit to Mexico City.

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CHEMISTRY

Post-War Research

Chemical research laboratories are expected to operate for the benefit of small and middle-sized businesses as well as for the large ones in the post-war era.

► CHEMICAL research laboratories, often thought of as a luxury that only big businesses can afford, will operate for the benefit of small and middle-sized businesses as well, in the post-war era. One section of the American Chemical Society meeting was devoted to a symposium on this subject, in which the speakers told how the needs for research will be met by privately managed consulting laboratories and by government research workers as well as by laboratories owned and operated by the corporations themselves.

Small businessmen were promised a share in the rapidly developing field of industries based on farm products, in the address of Dr. O. E. May, research coordinator of the U. S. Agricultural Research Administration.

"These include," he said, "the dry and wet milling of cereal grains, processing of fruits and vegetables, production and processing of vegetable oils, meat packing, dairy products, feeds, fertilizers, insecticides and fungicides, pharmaceuticals, naval stores, fermentation products, rubber, leather, fibers and textiles."

On all of these materials, and many besides, the U. S. Department of Agriculture was conducting very active research in its four great regional laboratories when the war interrupted all programs. The laboratories are concentrating on war problems now, but as soon as victory has been won they will return to their normal activities. Conversion, Dr. May stated, will not be a difficult or lengthy process for most parts of the program.

Small businesses will of course not be dependent entirely on what government scientists do for them. Charles H. Egan, of the Dewey and Almy Chemical Company, outlined some of the other research resources of the manager of a small business. Even a modestly financed plant can often afford to hire two or three research men, he pointed out, and it can also obtain more information by small research grants to be used in college and university laboratories.

The resources and scope of activity of a professional consulting firm with

a large laboratory were described by Raymond Stevens and Earl P. Stevenson of Arthur D. Little, Inc. They pointed out that research is sometimes needed in the most surprising spots: for instance, anthropologists had to be called in when transport planes for paratroopers were being designed, to make sure the seats would fit the anatomies destined to sit in them.

Oversupply of Chemists?

► MANPOWER problems are as acute in chemistry now as they are in industry and agriculture, and chemists have been doing some intensive thinking over them. At one section of the meeting a number of speakers offered ideas from various angles, and lively discussion followed presentation of their papers.

Sidney D. Kirkpatrick, editor of *Chemical and Metallurgical Engineering* and consultant to the War Manpower Commission, suggested that the post-war period would bring an opposite worry: what to do with all the chemists being demobilized from war industries and the armed services. Young men who went directly from college into war chemistry, and boys who were drafted before they could even finish their courses, will probably present the most serious problems.

About the latter especially, whom he characterized as "over-accelerated, and therefore undertrained," the speaker remarked, "The logical place for both the non-graduates and 'ninety-day wonders' is back on the campus. But can they be so persuaded?"

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CHEMISTRY

New Vinyl-Type Plastic Better Rubber Substitute

► A NEW vinyl-type plastic made from coal, air, salt and water to replace rubber for such uses as inner tubes, surgical gloves and molded goods was announced by the Glenn L. Martin Company.

Clayton F. Ruebensaal and Earl H. Sorg, who developed the new compound in the company's plastics research laboratory, claim to have overcome rather poor stability which has been an obstacle to wider use of similar vinyl "rubbers" now on the market. By adding a sealed-in plasticizer they obtained a product that retains its elasticity, resiliency and flexibility when exposed to air, water, sunlight, acid and alkaline solutions, and temperatures up to 250 degrees Fahrenheit.

Popularity of vinyl "rubbers," developed heretofore, has been hampered by their high cost which has been about three times that of natural rubber. But due to war shortages they have seen wider use, especially in molded products. Most of the big rubber companies and many chemical and plastic manufacturers have entered the field.

Although none of these products have become popular as inner tubes, the new vinyl material, dubbed Marvinol, "promises to outmode rubber in automobile inner tubes," Glenn L. Martin, company president, declared. The inner tubes can be fabricated more easily than from rubber, it is claimed, and seepage of air through sidewalls of the tube is entirely eliminated. Another advantage is that worn-out Marvinol products would be 100% reclaimable due to the thermoplastic nature of the vinyls and because they require no vulcanization.

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PLASTIC TIRE — An inner tube made from Marvinol being inspected by Clayton F. Ruebensaal, of the Glenn L. Martin Plastics Research Laboratory, who, with Earl H. Sorg, developed this new elasto-plastic.

PHOTOGRAPHY

Amateurs' Camera Film To Have Size Standards

► **BETTER PHOTOGRAPHIC** films and assurance of correct fit in the amateur's camera is promised by the first amateur roll film standards just prepared by the American Standards Association.

Camera and film makers have heretofore relied on their own ideas and measurements of supplies already on the market for designing new equipment such as cameras, photographic paper, films and spools. As a result, the American Standards Association points out, some cameras did not operate properly or functioned best only with a certain brand of film.

The new standards apply to spools, films and backing paper for ten sizes of snapshot films. Films conforming to the standards will function smoothly in cameras now in use and the specifications point the way for designers of new cameras and accessories. Development of other photographic standards is now under consideration.

Sizes and tolerances have been set up in centimeters, as well as inch measurements, to aid manufacturers exporting to countries using the metric system.

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MEDICINE

New Skin Grafting Method Uses Chessboard Pattern

► **THE CHESSBOARD** pattern and sticky paper feature a new method of skin grafting devised by Dr. P. Gabarro, former secretary of the Society of Surgeons of Catalonia, Spain, and now plastic surgeon in charge at an emergency hospital in England. Details of his method are reported in the *British Medical Journal* (June 12).

A piece of skin the desired size and thickness is cut from the donor area and laid, raw side up, on sterile, stiff, sticky paper. Skin and paper are then cut vertically into strips. These are placed, at the desired distance apart, on another piece of the sticky paper and then are cut horizontally into strips about the same size as the first strips. The result, Dr. Gabarro explains, is to obtain strips of paper with square grafts well spread and evenly spaced. These can be arranged in any design, but the chessboard pattern, he says, is easy to arrange and very even in distribution.

The method was designed as an improvement over the "pinch graft" technique. Pinch grafts are taken by picking up a cone of skin with a needle, cutting the cone at its base with a knife, and conveying the graft with the same needle to the recipient area. The pinch grafts are dotted over the recipient area with enough space between to allow for possible discharge. Grafting on a large area by this method is a "very long and tedious job." The sticky paper method is much faster, is easier on the donor area, and avoids danger of infection being carried by the needle from recipient to donor area.

The results with the new method have so far been "striking," Dr. Gabarro states, although he adds that it is too early to draw final conclusions.

Science News Letter, October 2, 1943

MEDICINE

Blood Circulation Test Aids Skin Grafting

► **ARTIFICIAL SUNSHINE** and a dye have been enlisted as a new aid to the plastic surgeon for certain types of skin grafting. The method, developed by Dr. James A. Dingwall, 3rd, and Dr. Jere W. Lord, Jr., at New York Hospital and Cornell University Medical College, is reported in the *Bulletin of the Johns Hopkins Hospital* (August).

The dye, sodium fluorescein, is injected into a vein. Under ultraviolet light, the area of the body through which the blood flows becomes a bright yellow green. In the test devised by the New York doctors, this phenomenon is used to show when blood circulation has been established between the patient's body and the tubed flap of skin being grafted onto a burned or scarred area.

In the first stage of this type of skin grafting, one end of the tubed flap which will become the graft is left attached to the place on the patient's body from which the graft is being taken. Once blood has started to circulate freely into the flap through the end in the new position, the original attachment can be cut and the tube opened out and attached entirely to the new position.

If this second stage of the grafting is carried out before blood circulation has been established, the graft will not get enough nourishment and will die. With the fluorescein test, it appears from the report, doctors can tell accurately when blood circulation is well enough established to carry out the second stage of the grafting.

Science News Letter, October 2, 1943

IN SCIENCE

ANIMAL HUSBANDRY

Experts Warn Stockmen Of New Swine Disease

► **DISCOVERY** of the first natural epidemic on record of vesicular stomatitis among hogs has brought a warning from the U. S. Department of Agriculture to the nation's stockmen.

"Owing to the present importance of protecting the livestock industry from every possible source of danger," the warning reads, "stockmen are urged to observe their animals closely and frequently, and to report symptoms of dangerous diseases promptly to their nearest veterinarian."

Vesicular stomatitis, characterized by high temperature at the start, and by sore feet and blisters on the snout, affects horses chiefly, sometimes cattle. When the disease first broke out among hogs in an anti-hog-cholera serum-producing plant at Kansas City, Kans., the symptoms suggested foot-and-mouth disease, a foreign plague non-existent in the United States since 1929.

Veterinary research experts of the U. S. Bureau of Animal Industry, Dr. H. W. Schoening and Dr. A. B. Crawford, flew to Kansas City, made various tests, identified the disease as vesicular stomatitis, and saw to it that all known measures were taken to eradicate the infection and to insure the purity of all biological products prepared in the establishment where the outbreak had occurred.

Science News Letter, October 2, 1943

ENGINEERING

Mining Administrator Awarded Institute Medal

► **CORNELIUS FRANCIS KELLEY**, chairman of the board of directors of the Ananconda Mining Co., has been awarded the Charles F. Rand Memorial Medal for "distinguished achievement in mining administration" by the American Institute of Mining and Metallurgical Engineers.

A son of a mine superintendent, the new medallist began copper mining when 17 as a member of a survey crew. Later he studied law and rose to head a large group of associated companies.

Science News Letter, October 2, 1943

NE FIELDS

GEOLOGY

Certain Germs Help In Locating Oil Deposits

► **DISCOVERY** that certain germs which feed on hydrocarbons, such as oil, will absorb particular wavelengths of light has led to a new method of finding petroleum deposits. Ludwig W. Blau of Houston, Texas, who has just been granted patent No. 2,330,026 on this unusual procedure, names the Standard Oil Development Company as the assignee.

To locate oil, soil samples are collected near the surface at spaced points over an area. The oil-consuming germs, and by-products which may be formed by their feeding, are extracted chemically from the soil. The extract from each sample is next placed in a light beam. The transmitted light is then split into its various wavelengths. When the tell-tale wavelengths are missing, results from the various samples may be interpreted to help locate oil deposits.

It is not yet known whether this phenomenon is due to the light's being absorbed by the germs themselves or by organic compounds which result from the germ action on the hydrocarbons.

Science News Letter, October 2, 1943

CHEMISTRY

Store Potatoes for Keeping At Correct Temperature

► **IF THE POTATO** shortage last spring led you to plant potatoes in your Victory garden so you would have a supply for this winter, you should be careful to store them at the correct temperature. For good keeping of potatoes, the U. S. Department of Agriculture recommends a storage temperature at from 40 to 50 degrees Fahrenheit.

Each potato in storage is a chemical factory in miniature, the Department scientists explain. How the factory will work and what product it will turn out depends on the storage conditions, especially the temperature.

If potatoes are kept too warm, they will use oxygen and literally burn themselves to death, so that decay follows. In this they are like most fruits and vegetables. Their activity at too low a temperature, however, is unlike that of

most other foods. As you know, a potato contains lots of starch. At a temperature below 38 degrees Fahrenheit, the potato chemical factory turns some of the starch into sugar.

This makes the potato less appetizing. It also accounts for the unattractive dark brown color that potato chips sometimes develop, whether made at home or in factories. The potatoes stored too cold develop enough sugar so that some of it caramelizes in hot fat, giving the dark color.

This starch to sugar change, fortunately, is reversible. Removing the potatoes from the cold and leaving them at room temperature for two weeks before using causes the sugar to turn back to starch and restores the high cooking quality of the potatoes.

What with Victory gardens and the big commercial crops of potatoes this year, we shall probably all be eating more of them than ever. Besides the fuel and energy value of their high starch content, potatoes furnish vitamin C. The amount per potato is small compared with tomatoes and citrus fruits, but when large quantities of potatoes are eaten, it mounts up.

Science News Letter, October 2, 1943

GEOGRAPHY

Mont Cenis Tunnel, Pass Should Not Be Confused

► **MONT CENIS** tunnel through the Alps connecting Modane, France, with Bardonecchia, Italy, reported to be partly destroyed by Nazi-hating Italians to render it useless to the Germans, is sometimes confused with Mont Cenis Pass, 17 miles to the east. Both are of strategic value.

The tunnel is used by the railroad from Paris and Lyons in France to Turin and the rest of Italy. It is eight miles long and approximately 26 feet wide. It is the earliest of the Alpine tunnels, having been opened in 1871 after 14 years of effort in its construction.

Mont Cenis Pass crosses the mountains at an elevation of nearly 6,900 feet near the junction of the Cottian and Gracian Alps. This is about 1,600 feet higher than Denver, Colo. A carriage road was built through it 140 years ago and a railroad was constructed along the carriage road in 1868. This railway was destroyed in 1871 when the tunnel was put into use. Hannibal, the Carthaginian general, used this pass, it is claimed by some historians, in his invasion of Italy in 218 B.C.

Science News Letter, October 2, 1943

NUTRITION

Vitamin C Now Retained In Evaporated Milk

► **A NEW** method of preserving vitamin C in evaporated milk which makes it possible to ship the milk to any part of the world and to store it without vitamin deterioration for six months or more has been developed at the Pennsylvania State College by Prof. F. J. Doan and D. V. Josephson, dairy manufacturing specialists.

Because vitamin C quickly oxidizes and vanishes in contact with air, it has never been easy and often impossible to store or maintain it for any length of time in foods at the level needed for healthy living. Even the body cannot store it, and we must eat our quota of about 75 milligrams each day to keep well. Babies, however, need only about 30 milligrams daily.

Sealing the evaporated milk tins in an atmosphere of nitrogen or under vacuum, the investigators at Pennsylvania State College found, increases by 50% the vitamin C retained after six months storage. If the milk is first fortified with 50 mg. of vitamin C, and then sealed without air, the milk will contain well over the desirable daily infant allowance, or the minimum adult allowance, of 28 to 30 mg. per can after six months storage and presumably longer.

The process follows the commercial practice closely, except for sealing, and could be easily adapted for commercial use, Prof. Doan explained. The cost of such fortification is slight, estimated at approximately 7.2 cents per case of evaporated milk, or 0.15 cents per 14½ oz. can.

The new method would insure that our soldiers, and the babies and peoples of reoccupied countries might have all the vitamin C they need every day.

Science News Letter, October 2, 1943

MEDICINE

Army Mule Carries Wounded In New Guinea Field

See Front Cover

► **MECHANIZATION** has not replaced the Army mule in such terrain as the New Guinea war theater. The photograph on the front cover of this week's SCIENCE NEWS LETTER is an official one of the U. S. Army Signal Corps. It shows a new pack-mule litter being tested by a Field Artillery unit in New Guinea.

Science News Letter, October 2, 1943

METALLURGY

Dust Makes War Tools

Powdered metals put under pressure in precise molds and then specially heat-treated make superior heavy-duty machinery parts.

By A. C. MONAHAN

► A PILE of dust, under the pressure of a new industrial process, becomes a major war tool.

It may seem a bit round-about in the rush of production today to turn pieces of steel or other metal into a fine powder and then reform this powdered metal into tools, gears and other pieces of heavy-duty machinery working for war.

One of the latest technologic processes, the art of powder metallurgy, is doing just that to speed and cheapen the production of the things we need to fight our enemy. In fabricating machine parts, instruments and tools by powder metallurgy, the metal is not melted. It is not poured into molds. Instead, under great pressure in very precisely machined forms, the minute pieces of pulverized metals are squeezed together and then heated to bind them permanently and give them as much or more strength than the ordinary cast, forged, rolled or stamped metal.

Recent developments have given this process, in limited use before the war began, a prominent place in manufacturing ordnance, munitions and other equipment for our fighting men. Results are obtained which cannot be accomplished in any other way. Two decades ago it was used only with metals very difficult to melt. Now it is used with practically all metals and with some non-metallic minerals. It is used with alloys and mixtures of metals which are not alloyed, and mixtures of metals and non-metallic minerals.

Use of Pressure

In the fabrication of an article made from metal powder, a mold is employed, usually of hardened steel. The mold is the precise size and shape of the object desired. The exact amount of the metal powder is put in the mold and controlled pressure is applied. The amount of pressure may be very slight; in fact, in making porous metal filters, practically no pressure is used. It is very great where strength is important, sometimes exceeding 100,000 pounds per square inch.

When shaped the object is removed from the mold and heat-treated—"sintered," metallurgists call it. This is done at a high temperature, but one below the fusion or melting point of the metals used. The sintering temperature necessarily is different with different metals and different combinations of metal. Steel is sintered at around 2,000 degrees Fahrenheit.

The time required for the heat-treatment differs also with different metals. For steel, it is about 20 minutes. In commercial practice, objects to be sintered are passed on endless belts through gas or electric ovens or furnaces at a controlled rate which assures their being under treatment the proper length of time.

The furnaces must contain a controlled atmosphere, otherwise oxidation would take place. Hydrogen, carbon

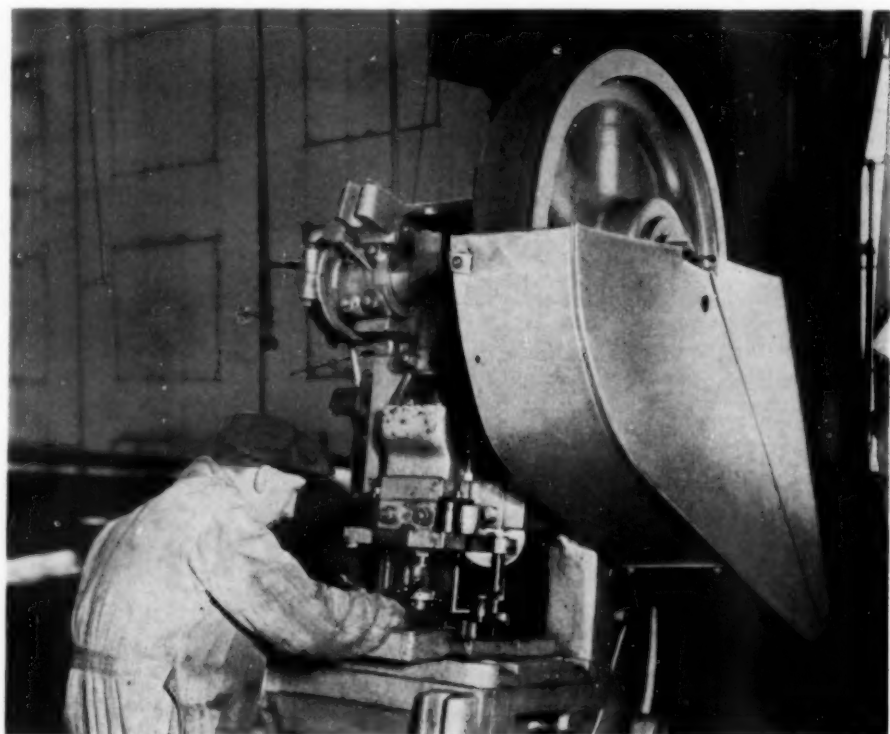
monoxide, cracked ammonia or other gases are used.

In this sintering process, the particles of metal are interlocked or knitted together; one scientist says they are "zippered." The parts come out of the furnace with a bright, smooth finish. They are ready for use without machining or finishing.

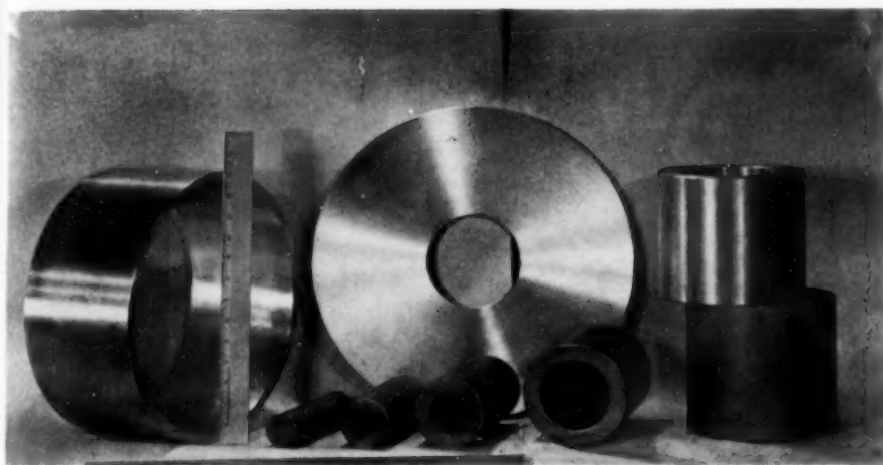
Porous Metal

Porous metal parts are often needed. These may be obtained in powder metallurgy by using metals with proper characteristics, and controlling the amount of pressure. Gas-forming substances are sometimes added which in the sintering process form capillary inter-connected passages.

One of the highly important uses made of porous parts is in self-lubricating bearings. These bearings must have sufficient porosity to hold a certain amount of oil or other lubricant. The lubricant works its way through the capillary passages to the rubbing parts. Sometimes the lubricant added is enough



TO SQUEEZE POWDER—To form tools and machine parts the minute pieces of pulverized metal are pressed together and then heated so that they are permanently bound together.



FROM METAL DUST—Durable metal-cutting tools and gears as well as numerous other objects needed to aid our production program are made today from powdered metal.

to last the life of the machines; in other cases additional lubricant must be supplied from time to time.

The history of powder metallurgy goes back at least a hundred years; some claim much longer. It is certain that platinum powder was used in making platinum articles over a century ago. Platinum has a very high melting point. Because of this, great difficulty was encountered in trying to put it into use. Platinum powder was easily obtainable. Scientists found that by pressure and heating at a temperature well below its melting point, satisfactory platinum objects could be formed. Similar results were obtained with iridium.

Powder metallurgy found another important application early in the present century. It was used to produce thin filaments of metallic tungsten for electric lamps. This extremely refractory metal, the melting point of which is about 6,000 degrees Fahrenheit, can be made available in powdered form. After its formation into briquets by pressure and sintering, it can be made stronger and more ductile by hot forge treatment.

New Development

The success of powder metallurgy in putting platinum, tungsten and other refractory metals to work is probably responsible for laboratory investigations made in the past two decades which, in turn, are responsible for the present wide use of the process and the many new uses developing each year.

Progress has now developed to a point where many types of machine parts, instrument parts and tools are made from

powders of single metals, metal alloys, metal mixtures that alloy during sintering, metal mixtures that remain unalloyed, and mixtures of metallic and non-metallic minerals. Pieces, composed of layers of different materials, are fabricated. Others are made of mixtures of metals whose specific gravity is so different that they would separate if melted.

Nearly As Hard As Diamonds

Hard cemented carbide-tool material is one of the most important products of powder metallurgy. It is nearly as hard as diamonds. It cuts metals at speeds several times as great as tools made from molten metals. Its use has greatly speeded up war production. The material consists of very small particles of a hard metallic carbide cemented together with a small amount of an alloy.

Tungsten-carbide was first used as the metallic carbide because it provided great strength and hardness. The cement used with it is a molten alloy formed by cobalt which has dissolved certain small amounts of tungsten carbide while in a liquid state. Tantalum carbide and titanium carbide are also used. No other practical method has been found for making satisfactorily this important tool material.

Wartime developments require a large number of electrical resistance parts made from powdered talc or steatite with electrical and dimensional properties obtainable by powder metallurgy, but in no other way now known. They require parts made of metal mixtures in which each metal retains its original electric characteristics. Alloying often

destroys these characteristics. Powder metallurgy is the answer. Combinations of copper and tungsten, and combinations of silver and nickel, tungsten or graphite, are examples.

Metal powders of practically all metals are now available, and also of many alloys. Commercial manufacturers use powders made by the reduction of metal salts by gases, electrolysis or atomization, or by mechanical disintegration of the metals themselves. Relatively pure iron oxide ores, in the presence of a reducing agent, form an iron-sponge at a temperature below the melting point of the metal. The sponge is pulverized mechanically. The atomization process consists of spraying a molten metal into a current of air or steam.

Until recently powder metallurgy was used only when melting and casting was not possible. Newer methods have now changed this. The process is economical, often less costly than the old process which involved melting, forming and machining.

The importance and possibilities of powder metallurgy to America's industries was foreseen a few years ago by Stevens Institute of Technology at Hoboken, N. J. In 1940 it established, under the sponsorship of eleven industrial concerns, a special powder metallurgical laboratory to conduct research work and to teach the art to student engineers in metallurgy. It was placed under the charge of a professor taken from an industrial concern which for several years had been using metal powders in manufacturing processes and had conducted much research in its own laboratories.

Science News Letter, October 2, 1943

ENGINEERING

Electrical Device Locks All Car Doors at Once

► GASOLINE may be rationed and car driving limited, but patents for many new devices for automobiles continue to be issued. A "coincidental locking system for automobiles" is among them. The inventors are Robert N. Ward of Royal Oak, Mich., and Roy H. Dean of Detroit. They assign rights in the patent (2,329,309) to the Ternstedt Manufacturing Co. of Detroit.

It is an electrically controlled device which locks all doors at the same time. It may be operated from either front door. By use of a switch the rear doors may remain locked whenever wanted.

Science News Letter, October 2, 1943

ANTHROPOLOGY

Neandertal Man Dumb?

Writer of new book on human ancestors suggests Neandertal Man wasn't as ape-like as originally supposed, according to more recent discoveries.

► NEANDERTAL MAN, whom people in general have been treating like a kind of ne'er-do-well great-uncle for a couple of generations, may not have been such a dumb brute after all, Prof. Raymond W. Murray of the University of Notre Dame suggests in a new book, *Man's Unknown Ancestors* (Bruce). The popular picture of him as a squat, hairy, shambling, clumsy-thumbed creature with dull eyes and a rather vacant expression was based on early finds of skeletal remains, which left some gaps that were filled by conjecture.

More recent discoveries, filling in the gaps, have changed scientists' ideas of how he stood and walked and used his hands. He apparently had a straighter posture and more adeptness with his fingers than we have been accustomed to give him credit for. Moreover, several anthropologists have pointed out that his half-gorilline eyebrow ridge was a mark of the older males only; Neandertal women and children lacked it. And as careful a student of human bones as the late Dr. Ales Hrdlicka has shown that massive, slope-chinned jaws of Neandertaloid type can be found on modern skulls of Eskimos, Melanesians and other primitive peoples.

Culturally, it has been known all along that Uncle Neandertal did fairly well, considering the times in which he lived. He was solidly established in possession of the two things that most characteristically differentiate man from even the cleverest of the beasts: fire, and the use of tools. And he buried his dead

with carefully arranged funeral gifts, which is strong evidence that he believed in a future life—that is, that he had a religion.

For the several groups or species of prehistoric men, now diversely named under such titles as *Pithecanthropus erectus*, *Sinanthropus pekinensis*, *Eoanthropus dawsoni*, etc., Prof. Murray adopts the simplified classification proposed by Franz Weidenreich, leader of studies on Peking Man, who drops all the polysyllabic generic names and lumps them all with living mankind in the single genus *Homo*. This system sets up three species: *Homo erectus*, which includes Peking and Java Man; *H. neanderthalensis*, sweeping in a rather wide range of ancient peoples, and *H. sapiens*. The latter species takes in not only modern men of all races and that aristocrat of the later Old Stone Age, Cro-Magnon Man, but also *Eoanthropus* or Piltown Man, who appears to have been a contemporary of the Neandertalers and was once considered to be very primitive indeed.

Science News Letter, October 2, 1943

PHYSIOLOGY

Signs of Eye Trouble To Look for in Children

► IF YOUR CHILD stumbles frequently or trips over small objects instead of stepping over or around them, don't scold him for being clumsy and let it go at that. The tripping and stumbling may be a sign that he does not see as well as he should. Take him to an eye doctor or consult your family physician or baby specialist.

Other signs which alert parents will regard as a warning that a child may have eye trouble needing the attention of a doctor are given by the National Society for the Prevention of Blindness as follows:

1. Difficulty in reading or other school work requiring close use of the eyes. This may first show up in poor marks at school.
2. The child frowns or rubs his eyes as if trying to brush away a blur.



KNOW HIM?—This is the way our Neandertal Man ancestor might look if he were dressed in modern clothing for a ride on the subway.

3. Blinks more than usual, cries often or is irritable when doing close work.
4. Holds a book or small toys close to his eyes.
5. Shuts or covers one eye or tilts his head or thrusts it forward when looking at playthings.
6. Is uninterested in distant objects or unable to take part in games such as playing ball.
7. Holds his body tense or screws up his face for either distant or close work.
8. Is sensitive to light.
9. Is unable to distinguish colors.

Tell-tale signs in a child's appearance which may mean eye trouble are: red-rimmed, encrusted or swollen eyelids; repeated styes; watery or red eyes; and, of course, crossed eyes.

If a child complains of dizziness, headache or sick stomach after using his eyes in close work in studying or working at a puzzle, or if he says things seem blurred or he is seeing double, he should be taken to the eye doctor.

Science News Letter, October 2, 1943

MATHEMATICS DICTIONARY

Invaluable in reading any book that uses mathematics.

THE JAMES MATHEMATICS DICTIONARY, the only such book now published, provides standard definitions of the terms and phrases from arithmetic through elementary differential equations, the technical terms ordinarily used in the applications of these subjects, and more advanced basic terms. Easy examples, many illustrations and all sorts of formulas are included. The appendix contains tables of weights and measures, a list of mathematical symbols and the tables ordinarily used in handbooks.

This dictionary is a great deal more than a collection of definitions. It explains, illustrates and correlates, stressing especially those operations that are hardest to understand. One reader has called it "Ten texts in one."

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SCIENCE NEWS LETTER

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PUBLIC HEALTH

Polio Cases Up

New high is reached in infantile paralysis epidemic with no sign of when it may be over. Dengue and influenza in island territories.

► INFANTILE PARALYSIS cases reached a new high total of 1,016 throughout the nation for the week ending Sept. 18, latest on which figures are available. Even that figure, over 100 more cases than were reported the previous week, may be increased slightly when delayed reports from Arkansas and Vermont are received at the U. S. Public Health Service.

The total of 906 for the week of Sept. 11 represented a decrease of some 50 cases and gave hope that the peak of the epidemic had been reached, but that hope proved false.

The largest number of cases during the week ending Sept. 18 was reported from Illinois, where cases jumped from 189 to 208. California also had a sharp increase during the week from 111 to 150. Other states reporting increases were: Washington, Texas, Kansas, Connecticut, Rhode Island and Massachusetts.

About all health authorities can say now about when the epidemic may be over is that in three of the last nine years, the peak of infantile paralysis cases came the last week in August. In one year, 1934, it came as early as June 23, and in one year as late as Oct. 3. In the other four years, the peak came between Sept. 12 and Sept. 18.

The year of the Sept. 18 peak, there had been 5,512 cases during the first 36 weeks of the year, with a total for the entire year of 9,451. The total for this year so far is between those two figures, 7,808, which does not give much encouragement for an early end of the epidemic.

Science News Letter, October 2, 1943

Island Epidemics

► MEANWHILE concern is felt over two epidemics brewing in island territories to the east and west. Dengue cases are still numerous in Honolulu, where 215 cases have been reported since the end of July. Latest reports give 36 cases for the week ending Sept. 4, and another 15 during the period Sept. 6-9.

Signs of an influenza epidemic appear in reports from Puerto Rico. Cases

jumped from 83 the week ending July 16 to 975 the week of July 23, and to 2,141 the week ending Aug. 6. No later reports have been received but public health authorities recall that when influenza was epidemic in continental United States three years ago, there had been outbreaks earlier in the year in both Puerto Rico and Hawaii. Hawaii reported an increase in cases in midsummer of this year, but the outbreak there seems to have died out.

Science News Letter, October 2, 1943

MILITARY SCIENCE

Three-in-One Torpedo Invented to Blast Axis

► A THREE-IN-ONE torpedo that can blast an enemy ship in several places at the same time is among the 502 patents granted this week by the U. S. Patent Office.

A central torpedo carrying two smaller auxiliary torpedoes attached to it is launched from conventional equipment now in use on ships and airplanes. As the mother torpedo nears the target, a time-controlled mechanism releases the brood of youngsters which speed off to strike on either side of the main explosion. George Wise of Brooklyn, N. Y., who has received patent No. 2,329,736 on the weapon, gives the government permission to use his invention without payment of royalty.

Science News Letter, October 2, 1943

MEDICINE

Healthy Eyes, Ears, Teeth Necessary for Young Child

► JUNIOR and Sister need healthy eyes, ears and teeth for school, as well as vaccination and other protection against some of the diseases their school mates may have.

Poor hearing is another condition that often makes children seem backward and dull. In some schools hearing tests are given to all the children. You can make sure that your child will not get off to a bad start through poor hearing by having his own doctor make the

test. If there is any defect, the doctor will advise about putting him in a special class and having him learn lip-reading to make up for the defect. The steps to be taken will depend on the extent of hearing defect or loss.

When Junior and Sister are ready to start school, they probably have acquired their six-year molars. These are the first and most important of the permanent teeth and should be carefully watched and any cavities filled promptly, so that these important grinders will last throughout Junior's or Sister's life. A visit to the dentist before starting school is therefore in order, unless the children are already making regular visits for a check on the health of their teeth. They will begin to lose their baby teeth soon after starting school, but these should not be lost prematurely through decay because they are needed to keep the mouth in the right shape for the permanent teeth.

Science News Letter, October 2, 1943

NUTRITION

Nut Butter Makers Seek Better Skinning Methods

► IF YOU can skin the kernels of black walnuts, hickories and pecans quickly and completely, experts of the U. S. Department of Agriculture here want to know how you do it. Ground fine these nuts make butters that help piece out our dairy supply in wartime, but little spots of the skin in the nut butter detract from the esthetic attractiveness, although not the taste.

Science News Letter, October 2, 1943

LEARN SPANISH

THE LANGUAGE OF
TOMORROW'S BUSINESS
BY
PLAYING CARDS



It's easy to learn to speak, read and write Spanish this popular new way... and it takes only 1/2 of the time usually required to master a foreign language. Play Solitaire or play the Course with a member of your family or while you entertain friends. Prepares for the thousands of post-war opportunities that will be available to Spanish-speaking men and women when trade with our Latin-American neighbors is at its peak. Remember... 2, 3 or 4 persons can learn at no extra cost. 4 decks of cards and Cloth-Bound Text Book, only \$2 postpaid.

Money back if you fail to learn.

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• New Machines and Gadgets •

❁ **POWERFUL PORTABLE** searchlights with a strength of 110,000 beam candle-power and a weight, including batteries, of twelve and a half pounds, are available for military and civilian use. Objects may be seen a half mile away. The battery cells are made of a transparent plastic.

Science News Letter, October 2, 1943

❁ **HEAVY GUN TUBES** made from seamless steel tubing is a war development which saves much time and material. By this method a single production line turns out over 6,000 tubes for 75 and 40 millimeter guns in a month. It replaces the old standard forging method.

Science News Letter, October 2, 1943

❁ **MOVIES** of acrobatic warplanes complete with battle sounds provide elusive targets for aviation gunners in training. The photograph shows a gunner learning to keep his sights on the fast-moving plane thrown on the screen.

Science News Letter, October 2, 1943



❁ **A DOUBLE-EDGED** razor blade rolled into an open cylinder with the two cutting edges facing each other, together with a special handle and sharpening device, has been patented. It may be pulled or pushed, one edge cutting and the other acting as a guard.

Science News Letter, October 2, 1943

❁ **SKI-TROOP FOOTWEAR** with rubber-cleated soles and heels, now in production, provide excellent traction on stone and ice. These new mountain-climbing boots clear themselves automatically of snow and ice and are nearly noiseless in use.

Science News Letter, October 2, 1943

❁ **ADHESIVE STICKERS** of paper thickness are replacing thumb-tacks to hold drawings and blue-prints on drafting boards. They are applied without moisture and are easily detached. T-squares slide over them.

Science News Letter, October 2, 1943

❁ **NON-REFLECTING** eyeglasses and windshields are made by an improved surfacing treatment. Greater visibility results from its use on show windows and cases, clock faces, and instrument boards. The method can also be applied to large areas of varnished woods, metals or photographs.

Science News Letter, October 2, 1943

❁ **LIFE-SAVING LAMPS** help locate men overboard at sea. They are completely encased in water-proof plastic with transparent red tops.

Science News Letter, October 2, 1943

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 176.

Sweden's sixth submarine, especially designed for work in waters around Sweden, has recently been launched.



Planting for Birds

► A LITTLE thought in planning your home grounds will get you birds in winter as well as flowers in summer. When you are setting out your fall planting of shrubs, or thinking of the ones you will set out next spring, it is always well to think of your borders and masses as spare rooms for bird guests. Even a few shrubs of the kinds that afford birds shelter and food will attract interesting neighbors, even in closely settled urban communities.

There are many species of shrubs, attractive in themselves as ornamentals, that are veritable winter pantries for the hardy feathered folk that stay with us through the cold season. Sumac is an old standby; its erect clusters of dry-fleshed fruits are swarmed over by hungry birds whenever snow lies too deep on the ground for them to find the seeds of lower-growing plants.

Fleshier berries in wide variety and a considerable range of interesting color can be set forth to tempt the birds. There is the white of snowberry, and dogwood, the red of honeysuckle, Japanese barberry, and coral berry, the blue of viburnum, wild grape and Virginia creeper. Some of these are so bitter or acrid to the human tongue that we wonder how the birds can eat them; but avian taste does not seem to be the same as ours.

Shelter as well as food is a consideration in setting out shrubs with an eye to attracting birds. Fortunately again, there are many shrubs and small trees that are pleasant to look upon, even in their leafless state, which at the same time are well-branched and twiggy—just the kind of thing birds like as roosting-places and windbreaks. Such,

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for example, are the bright-barked osier dogwoods, the yellow-boughed Forsythias, some kinds of ornamental willows, and brown-twigged alder bushes.

Of course, no shrubbery planting is complete without at least a few conifers, among which hemlocks, low junipers and spruces are favorites. All these have foliage so dense that they afford good shelter from wind and snow.

If feeding trays and water-pans are set up to make the place even more attractive to birds, care should be taken that these are not placed so deeply in the shrubbery as to afford ambush to stray cats. Both food and water should be offered on top of posts, preferably with cat-proof guards beneath them, and with some kind of partial roof shielding them from prevailing winter winds.

Science News Letter, October 2, 1943

ENGINEERING

Maritime Commission Receives 2,000th Vessel

➤ OVER 2,000 ocean-going vessels built under Maritime Commission contract since Pearl Harbor is the record celebrated on Monday, Sept. 27, two years from the day the first Liberty ship, the Patrick Henry, slid into the water. Cooperation between scientists, engineers and production men made this unparalleled achievement possible.

The 2,000th vessel since Pearl Harbor is a standard tanker built at the Kaiser shipyard at Portland, Ore. It was delivered with steam up on Sept. 11, and was placed in service immediately in the tanker fleet.

The Oregon Shipbuilding Corporation of Portland, two days later, became a member of the Maritime 250 Club when it sent into service a Liberty ship only 23 days from the laying of its keel. Another Kaiser yard was the first in this club when the Richmond, Calif., plant delivered its 250th vessel on July 19, 1943.

Liberty ships are not named for living persons. They are named to honor outstanding American men and women who accomplished work of nation-wide value in the field of arts, letters and science. The Dwight W. Morrow was launched in Florida on Sept. 19, named in honor of the notable lawyer, banker, diplomat, United States Senator, and sponsor of science as a member of the Board of Trustees of the Smithsonian Institution.

Science News Letter, October 2, 1943

First Glances at New Books

➤ MANY PEOPLE are starving in the midst of plenty, so far as the medical and health services are concerned, because they do not know where to go for free or low cost service in nursing, medical and hospital care or aid in child guidance and mental health problems even when such services are amply provided in the community. To aid the 600,000 or more residents of the Washington Heights and Riverside health districts of New York City, a GUIDE TO HEALTH SERVICES available to them has been prepared by the Washington Heights-Riverside District Health Committee. Although its use will be limited to residents of one section of New York City, the book is mentioned here because it may stimulate civic groups in other cities and towns to sponsor preparation of guides to the medical and health services of their own communities.

Science News Letter, October 2, 1943

➤ GETTING THERE, subtitled The Psychomotivatease, is a little book of jingles about all sorts of animals' means of locomotion, by Robert M. Yergason. (Author, \$1). A sample:

The Myriapoda, fast or slow,
On multitudinous legs must go,
Astonishing though it appears,
There's rhythm in their myomerics.

Science News Letter, October 2, 1943

➤ AVIATORS will find FOGS, CLOUDS, AND AVIATION by W. J. Humphreys a valuable textbook covering these subjects. It is well illustrated with views of cloud forms. (Williams & Wilkins, \$3).

Science News Letter, October 2, 1943

➤ JAPAN: A GEOGRAPHICAL VIEW brings together basic facts concerning the strategic position, physical geography and economic conditions of that country. A number of maps are included. It is a publication of the *American Geographical Society*, prepared by Guy-Harold Smith and Dorothy Good. (\$1.50)

Science News Letter, October 2, 1943

➤ NAVAJO INDIANS, unlike some other tribes, are very chary about adopting white men into their membership. Being an "honorary Navajo" really is an honor. Father Berard Haile, who has spent his whole active life among them, and has been an accepted Navajo for many years, has thus enjoyed an unparalleled opportunity to study the culture of this tribe, about whom everybody has heard but almost nobody really knows anything. In ORIGIN LEGEND OF THE NAVAJO FLINTWAY, he presents us with a detailed and exhaustively documented monographic treatment of one of their important ceremonies. (U. of Chicago Press, \$3)

Science News Letter, October 2, 1943

Just Off the Press

BIOCHEMISTRY OF THE FATTY ACIDS AND THEIR COMPOUNDS, THE LIPIDS—W. R. Bloor—Reinhold Pub., 387 p., \$6. A compilation and evaluation of material on the fatty acids concerning which there is a developing interest due to recognition of their present uses and their value as background for future utility.

ELECTRICITY:—And Its Application to Civilian and Military Life—Charles A. Rinde—Harcourt, Brace, 466 p., illus., \$1.96. A study of electricity for both pre-induction and ordinary classroom use.

ELECTRONIC PHYSICS—L. Grant Hector, Herbert S. Lein, and Clifford E. Scouten—Blakiston, 355 p., illus., \$3.75. A beginners' text in modern electronics.

AN INTRODUCTION TO FOODS AND NUTRITION—Henry C. Sherman and Caroline Sherman Lanford—Macmillan, 292 p., illus., \$2.

JAPAN: A Geographical View—Guy-Harold Smith and Dorothy Good—Amer. Geographical Soc., 104 p., illus., \$1.50, special publication No. 28.

MAN: REAL AND IDEAL: Observations and Reflections on Man's Nature, Develop-

ment, and Destiny—Edwin G. Conklin—Scribner's, 247 p., \$2.50.

NERVOUSNESS, INDIGESTION AND PAIN—Walter C. Alvarez—Hoeber, 488 p., \$5. 3rd ed.

OZARKIAN AND CANADIAN CEPHALOPODS: PART 2: BREVICONES—E. O. Ulrich, Aug. F. Foerste, A. K. Miller—Geological Society of America, Special Papers No. 49, 240 p., illus., \$2.50.

PAPERS FROM THE SECOND AMERICAN CONGRESS ON GENERAL SEMANTICS: Non-Aristotelian Methodology (applied) for Sanity in Our Time—M. Kendig, ed.—Institute of General Semantics, 579 p., illus., \$5. Full report on "The New Basic Methodology of Science" for application to all human affairs, the general semantics of Korzybski. Seventy-three chapters, including sections on "public psychological adjustment" and "reconstruction of education."

PRINCIPLES OF SYSTEMATIC PSYCHOLOGY—Coleman R. Griffith—Univ. of Ill., 718 p., \$4.50. A comprehensive exploration and scholarly appraisal of the field by a professor of education of the University of Illinois.

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